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Erosion Control Can Pay Off

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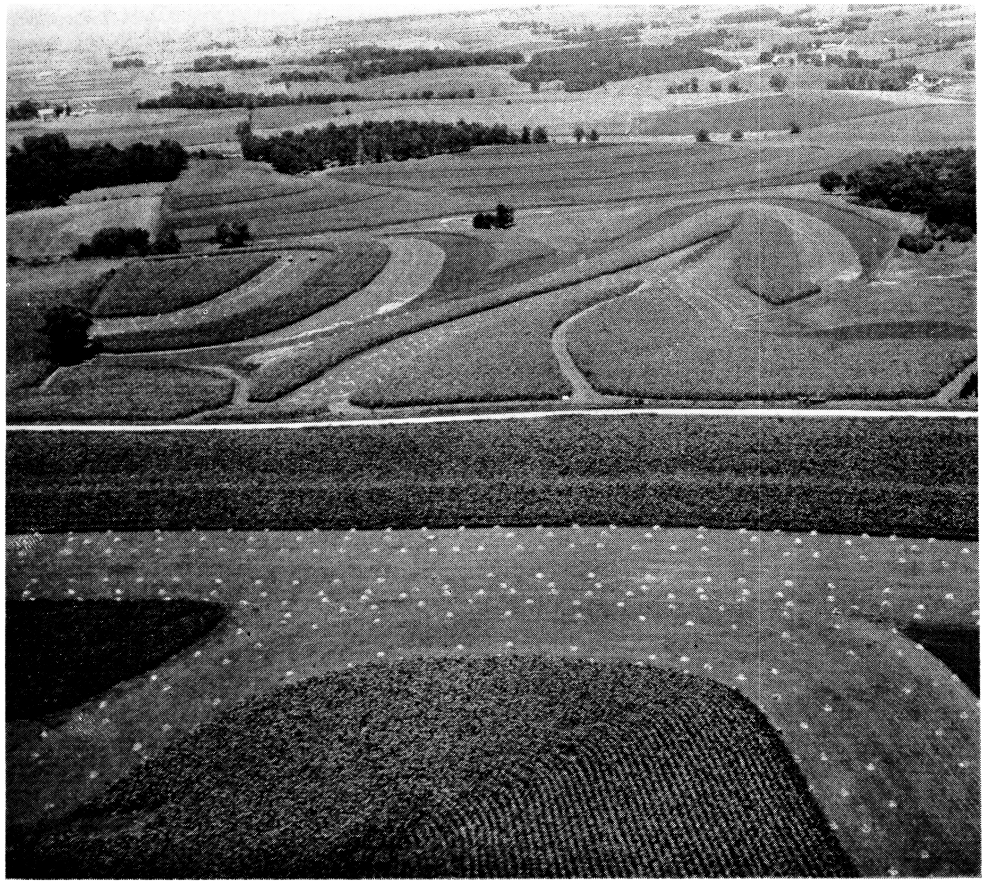

Erosion Control Can Pay Off

Here is the first of a series of articles dealing with erosion control practices and how they can affect your farm organization.

by Carl W. Allen and Earl O. Heady

EROSION CONTROL on your farm—what will it cost? What returns can you expect? How will it affect the organization plan for your farm? How much extra capital will you need to start an erosion control plan?

Farmers want answers to those questions along with many others about farming systems that control erosion. And they're all good questions.

To answer some of these questions, we began a study in southwest Iowa 3 years ago. Even though this study was confined to one area, the same problems exist in different degrees elsewhere in the state. And we found that farmers practicing a fair amount of erosion control in the area of our study had a farm plan that resulted in an average of 27 percent more income than those who practiced little or no erosion control.

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Over-all Picture

Right now, we'd like to describe the over-all study and tell about the returns realized under different degrees of erosion control. We'll also tell a little bit about necessary adjustments in the farm plan and the capital requirements. In some later articles, we'll tell about differences in individual practices and rotations and throw some light on the timing of returns.

Our study included the Marshall silt loam area covering parts of Fremont, Mills, Pottawattamie, Page, Cass and Montgomery counties.

We selected a group of similar farms between 140 and 180 acres in size containing mostly Marshall silt loam of 2 to 11 percent slope with some Shelby and bottom soils (see table 1).

We limited the farms to only those that had a soils pattern which included less than 25 acres of Shelby soils and between 40 and 75 acres of a combination of bottomland and Marshall silt loam of less than 4 percent slope. It's impossible to find a farm with rolling Marshall silt loam which doesn't have some level land in the bottom or perhaps some sloping Shelby soil.

We obtained pretty complete information on cropping history, the land use pattern, crop and livestock productions. We based our study mainly on 1945 data using other information for 1942 through 1946.

The Soil Conservation Service and Iowa State College agronomists provided soil maps of each individual farm showing the kinds of soil, percents of slopes and amounts of earlier erosion. With that information along with the types of conservation practices used, we divided the farms into two groups. We put the farms having the most estimated tons of soil loss per acre in the "low conservation farms" group. Farms with the least soil loss per acre were placed in the "high conservation farms" group. With a total of 90 farms, we had 45 farms in each group.

All Potentially Productive

After checking and rechecking, we found no real differences in the farms themselves. We believed a 160-acre farm in the low conservation group **could** be as productive as a similar farm in the high conservation group. There were big differences in production of crops and livestock. But some of the differences were due to differences in farm plans.

So, these differences in farm organization plans can really be expressed in dollars—within limits — since higher production normally means higher returns.

The high conservation group averaged 27 percent more net income than the low conservation

TABLE 1.

Acreage of Specified Soil Types and Crop Land.

Group	Acreages of specified soils				Acres of tillable land	Total acres
	Bottom-land soils	Marshall silt loam, less than 4 percent slope	Marshall silt loam, 4 percent slope and over	Shelby		
High erosion control	24.9	35.0	88.8	6.9	132.1	157.1
Low erosion control	25.3	37.4	86.3	9.9	128.6	158.5

group based on 1945 prices. On an average of 1937-41 prices, the difference in net income was 32 percent, and at 1931-36 prices, the difference was 20 percent—both in favor of high conservation group farms.

Two Big Items

It wasn't the actual process of the controlling erosion which resulted in higher incomes. It was the farm plan and systems of farming associated with erosion control. So here, two big items help explain the greater returns on the high conservation farms. One is the dollar volume of business. The other is the amount of capital, labor and management skill used.

The high conservation group—using the better systems of controlling erosion—had more livestock. This seems to be a factor associated with rather than a result of controlling erosion.

More roughage was available on the high conservation farms. That meant more roughage to feed through roughage-consuming livestock and additional grain to be used through grain-consuming livestock—mostly hogs. The erosion control farms used livestock as a method of processing and marketing forage.

Since the gross return per $100 of feed fed in 1945 varied from $140 to $200 depending on the class of livestock, it's obvious that this procedure alone added to income.

Low conservation group farms **sold** an average of 1,002 bushels of corn each year, while high conservation farms **bought** an average of 159 bushels each year for additional feed. The difference in amount of feed fed to livestock and in the labor and capital that go with it makes up most of the difference in volume of business.

Without any change in practices or rotations, the low conservation farms would have had a larger volume of business and probably more income if more corn had been processed on the farm. But that would require a greater investment in livestock.

Capital Requirement

And that brings up the capital requirement. Processing a greater amount of feed through livestock to attain a greater volume of business wouldn't have been possible without additional capital investment. Table 2 shows some comparative figures on production and investment in livestock for the two groups of farms.

According to our figures, about $3,000 would be needed to convert a low conservation group farm to an erosion-control system of farming at 1945 prices. At least $1,000 would be required for investment in conservation practices, another $1,000 in fence and building alterations and the rest mainly in livestock. Too, some additional labor would be required for the livestock.

Even with more livestock, however, the low conservation farms wouldn't have had returns as large as those of the high conservation farms. Their total production of grain and roughage was less (see table 2).

Since the farms in both groups were about the same from the standpoint of soil resources, this means the farms in the low conservation group weren't carrying out such practices as contouring, terracing and rotations to the extent that high conservation farms did. So increased production can be credited, at least in part, to these practices.

Corn yields were 11.3 bushels per acre higher on the high conservation farms. Hay yields were a little higher, too. But, because of increased acreages in roughage, the total feed units in forage were considerably greater.

Many of the low conservation farms had so few acres in legumes that total grain production could be raised by using a better rotation with more legumes.

High conservation farms were more systematic in having corn follow legumes. They used legume and meadow crops to better advantage by not plowing them up too soon or leaving them down too long.

When legumes are plowed too soon, full benefits aren't obtained from growth in adding nitrogen and organic matter. If they're left down too long, it means either a reduced acreage and production of corn or more fields where corn follows corn on another part of

TABLE 2.

Land Use, Yields and Feed Production.

Total acres	High conservation farms	Low conservation farms
Acres row crops	62	84
Acres small grain	30	25
Acres all grain	93	109
Acres hay	26	22
Acres rotation pasture	14	9
Total acres of forage	65	51
Corn yield per acre	63.9	52.9
Hay yield per acre	1.9	1.7
Feed units grain produced*	4475	4866
Feed units forage produced*	2209	1564
Total feed units produced*	6694	6430
Percent of total feed produced in forage*	33	24

* All feeds converted to a corn equivalent on the basis of total digestible nutrients (1 bushel of corn equals 1 feed unit).

the farm. Thirty-two percent of the intertilled acreage—mostly corn—on the low conservation farms had been in grain crops for 3 or more years in succession. For the high conservation group only 8 percent of the acreage had been in grain crops for 3 years or more.

Management, Risks

Changing over to an erosion-control farming system with more livestock generally requires more variety of skill in management and carries greater risks.

Where additional livestock enterprises are added, the operator must have knowledge about more kinds of production. He also has to try to figure out such things as buying and selling prices.

Managerial ability is important in conditioning the specific type of livestock best adapted to a particular farm. It's important, too, in determining whether or not the plan will actually result in increased income.

TABLE 3.

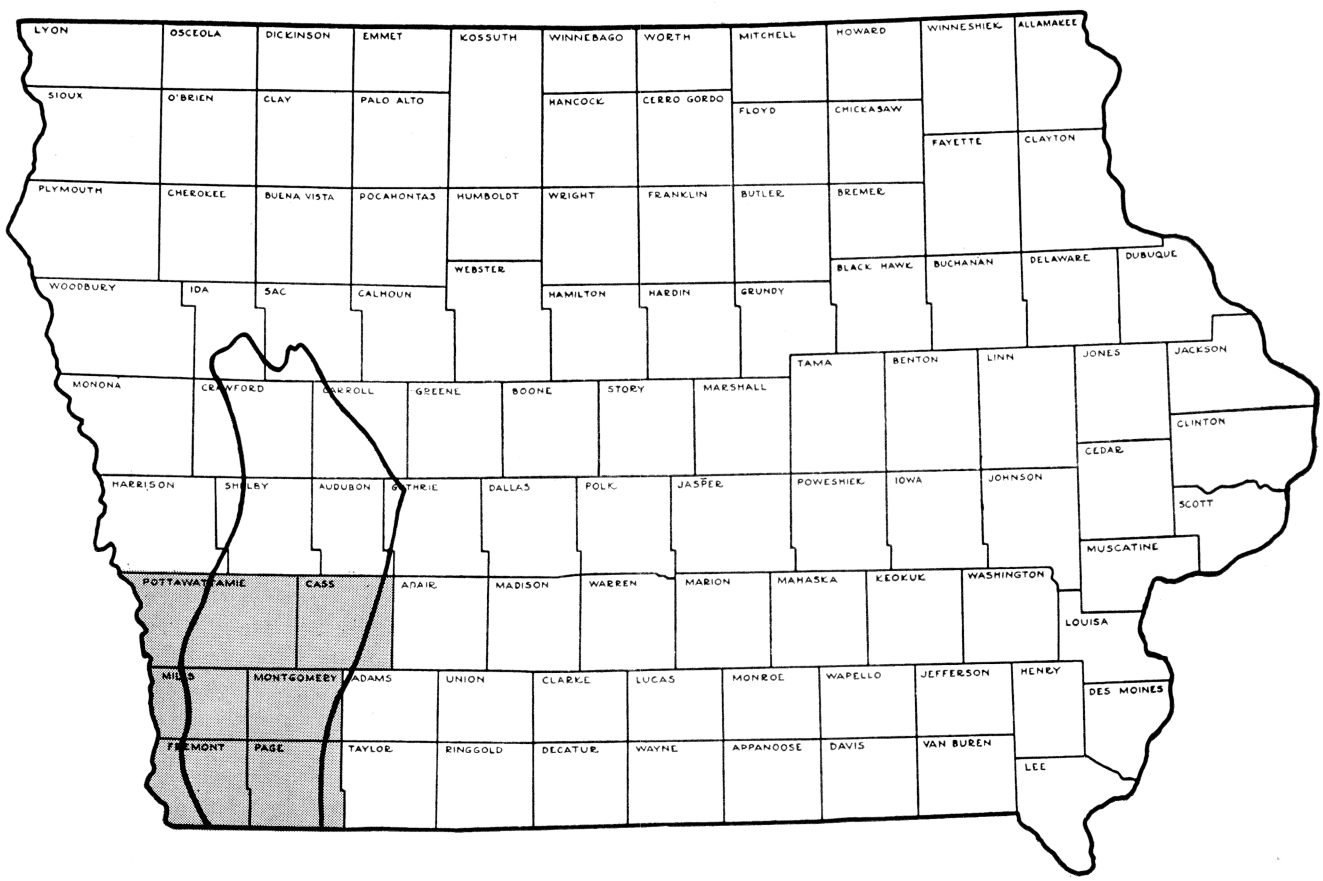
Some Organizational Characteristics.

	High conservation farms (45)	Low conservation farms (45)
Value of Farm Production		
Gross profits	$7058	$6056
Net sales crops	285	1348
Net production livestock	6773	4708
Livestock investment	4552	3850
Percent feed fed in grain	69	68
Months labor used	16.7	15.8

The risk or variability of returns that comes with some types of livestock farming is greater than for others. Changing the farm system may result in higher average returns over the years, but it may bring greater variations in year-to-year returns. Whether the operator should adopt a livestock enterprise or a complete system of farming depends a lot on his financial position and his ability to withstand risks.

He shouldn't have to borrow to an extent which might endanger his solvency in an unfavorable year.

Unless there's sufficient capital and managerial ability available, the operator may have greater returns by following a cash-grain system even though it isn't as effective in controlling erosion.



The heavy black line on the map above shows the border of the Marshall silt loam area. The shaded area indicates the counties in which study was made.